

## REMARKS

### I. PRELIMINARY REMARKS

Minor amendments have been made to the specification and drawings. Claims 5, 12, 13, 18, 21, 22, 25 and 27 have been amended.<sup>1</sup> Claims 53-62 have been added. Non-elected claims 36-52 have been canceled. Claims 1-35 and 53-62 remain in the application. Claims 10, 11, 16 and 17 have been withdrawn from consideration. Reexamination and reconsideration of the application, as amended, are respectfully requested.

### II. FORMALISTIC ISSUES

The Office Action's recognition of the use of trademarks on pages 8 and 10 of the specification is noted. Applicant also respectfully notes that the trademarks have been properly used.

The typographical error on page 4 has been corrected in accordance with the Examiner's suggestion.

The specification and claims have been objected because of the use of the term "bi-product." Applicant respectfully submits that the objection has been obviated by the substitution of the term "byproduct" for "bi-product" in the specification and claims in accordance with the Examiner's suggestion.

The reference to "slurry of coal" on page 2 of the Office Action appears to be a word processing error.

Applicant respectfully submits that the objection to the drawings has been obviated by the addition of reference numeral "124" to Figure 4.

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<sup>1</sup> The amendments to claims 5, 12, 13, 21 and 27 merely obviate minor informalities unrelated to patentability and do not change the scope of the claims.

### III. REJECTION UNDER 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 31-35 have been rejected under 35 U.S.C. § 112, first paragraph, because the specification purportedly “does not reasonably provide enablement for [a] cartridge further comprising a second reactant stored in a reaction chamber.” The rejection under 35 U.S.C. § 112, first paragraph, is respectfully traversed. Reconsideration thereof is respectfully requested.

Claims 31-35 are directed to a “reaction chamber,” not to a “fuel cartridge” as asserted in the rejection. Additionally, the present specification clearly indicates that the reaction chambers disclosed therein can be used in situations that involve first and second reactants. For example, the present specification includes the following paragraph:

It should also be noted that the exemplary reaction chamber 104 **has application in areas other than fuel cartridges**. More particularly, the reaction chamber is useful in any situation where it may be desirable to separate gaseous and liquid reaction products of **two or more reactants**, especially in those situations where the orientation of reaction chamber may vary during operation.

[Page 11, lines 15-19, emphasis added.] Applicant respectfully submits, therefore, that the rejection under 35 U.S.C. § 112, first paragraph, is improper and should be withdrawn.

### IV. REJECTIONS UNDER 35 U.S.C. § 102 AND 103

#### A. The Rejections

Claims 1-8, 12-14 and 18-30 have been rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent Pub. No. 2001/0045364 to Hockaday et al. (“the Hockaday ‘364 publication”). Claims 9 and 15 have been rejected under 35 U.S.C. § 103 as being unpatentable over the combined teachings of the Hockaday ‘364 publication and U.S. Patent No. 5,432,023 to Yamada (“the Yamada ‘023 patent”). The rejections under 35 U.S.C. §§ 102 and 103 are respectfully traversed with respect to the claims as amended above. Reconsideration thereof is respectfully requested.

## B. The Cited References

The Hockaday '364 publication discloses a variety of hydrogen supplying devices. As illustrated in Figure 9, which was referenced in the Office Action, one of the devices disclosed in the Hockaday '364 publication stores fuel 7 in a wicking material 114 that is inside a bladder 113. The bladder 113 maintains pressure on the fuel 7. A puncture needle 111 is used to connect the bladder 113 to a container 122 with catalytic surfaces 107. Flow through the needle 111 is actively controlled by a valve 110. A filter 106 allows hydrogen gas to flow out of the container 122.

Turning to Figure 3, which was also referenced in the Office Action, the Hockaday percolation generator 12 includes fuel 7 and wicking material 39 within a porous hydrophobic liner 32. The liner 32 is located within an elastic chamber 38. A capillary tube 40 with a catalyst coating 33 is located within an unnumbered structure positioned within the wicking material 39. It appears that the capillary tube 40 receives fuel 7 by way of the capillary exit 35. Hydrogen produced by the reaction within the capillary tube 40 exists the unnumbered structure through a filter 31. Fuel 7 and, apparently, byproducts are returned to the interior of the liner 32 by way of an exit 34 and a vent 42. Excess hydrogen that fills a void 36 between the liner 32 and elastic chamber 38 as the fuel 7 is consumed is vented by a gas pressure vent 37.

The Yamada '023 patent discloses the use of porous material to **remove** water produced in the oxidation electrodes of a fuel cell during a fuel cell reaction. [Abstract.] More specifically, the Yamada '023 patent discloses using the capillary forces associated with porous material to pull water away from the oxidation electrodes.

## C. Discussion Concerning Claims 1-9

Independent claim 1 calls for a combination of elements including “an open region that connects [a] fuel reservoir to [a] reaction chamber” and “a **passive structure** located within the open region adapted to resist fluid flow from the fuel reservoir to the reaction chamber.” The respective combinations defined by claims 2-9 include, *inter alia*, the elements recited in claim 1.

Referring first to the rejection under 35 U.S.C. § 102, applicant respectfully submits that the Hockaday '364 publication fails to teach or suggest each and every element in the claimed combinations. For example, the Office Action has taken the position that the Hockaday valve 110 corresponds to the claimed "passive structure." Applicant respectfully submits that there is no reasonable interpretation of the term "passive structure" that would read on a valve, such the Hockaday valve 110, that actively controls the output of fuel.<sup>2</sup>

As the Hockaday '364 publication fails to teach or suggest each and every element of the combination recited in independent claim 1, applicant respectfully submits that claims 1-8 are patentable thereover and that the rejection under 35 U.S.C. § 102 should be withdrawn.

Turning to the rejection of claim 9 under 35 U.S.C. § 103, claim 9 indicates that the aforementioned "passive structure ... adapted to **resist** fluid flow" is a "porous structure." In other words, the claim calls for a porous structure that is adapted to **resist** fluid flow. The Office Action has apparently taken the position that it would have been obvious to either (1) replace the Hockaday valve 110 with the Yamada porous material or (2) position the Yamada porous material somewhere upstream or downstream of the Hockaday valve 110.<sup>3</sup> Applicant respectfully submits that these positions are without merit. First and foremost, there is nothing in the Yamada '023 patent that even remotely suggests using the porous material disclosed therein in the manner proposed in the Office Action. The Yamada '023 patent teaches using porous material to **cause fluid flow, not to resist fluid flow**. Moreover, with respect to replacement of the Hockaday valve 110, it certainly would not have been obvious to replace a valve, the purpose of which is to **prevent** fluid flow, with a structure that is specifically designed to **cause** fluid flow.

As the Hockaday '364 publication and the Yamada '023 patent fail to teach or suggest the combination of elements recited in claim 9, whether viewed alone or in

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<sup>2</sup> "Claims in an application are to be given their broadest reasonable interpretation **consistent with the specification** [and] claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Young and Sneed*, 218 USPQ 384, 388 (Fed. Cir. 1983) [Emphasis added.]

<sup>3</sup> Applicant respectfully requests that, should the rejection be maintained, the Examiner clarify this issue in the next Office Action in order to clarify the issues for appeal.

combination, applicant respectfully submits that the rejection of claim 9 under 35 U.S.C. § 103 should also be withdrawn.

#### **D. Discussion Concerning Claims 12-15**

Independent claim 12 calls for a combination of elements including “an open region that connects [a] fuel reservoir to [a] reaction chamber” and “a **passive structure located within the open region** adapted to create **capillary forces to resist flow** of the fuel containing substance from the fuel reservoir to the reaction chamber.” The respective combinations defined by claims 13-15 include, *inter alia*, the elements recited in claim 12.

Referring first to the rejection under 35 U.S.C. § 102, applicant respectfully submits that the Hockaday '364 publication fails to teach or suggest each and every element in the claimed combinations. For example, the Office Action has taken the position that the Hockaday valve 110 corresponds to the claimed “passive structure” and that the needle 111 corresponds to the claimed “open region.” Applicant respectfully submits that there is no reasonable interpretation of the term “passive structure” that would read on a valve, such the Hockaday valve 110, that actively controls the output of fuel. Nor is there anything in the Hockaday '364 publication which indicates that the valve 110 is “adapted to create capillary forces to resist flow of fuel” to the container 122, as is also called for in the combination defined by independent claim 12.

As the Hockaday '364 publication fails to teach or suggest each and every element of the combination recited in independent claim 12, applicant respectfully submits that claims 12-14 are patentable thereover and that the rejection under 35 U.S.C. § 102 should be withdrawn.

Turning to the rejection of claim 15 under 35 U.S.C. § 103, claim 15 indicates that the aforementioned “passive structure ... adapted to create capillary forces to **resist** fluid flow” is a “porous structure.” In other words, the claim calls for a porous structure that is adapted to create **capillary forces to resist** fluid flow. The Office Action has apparently taken the position that it would have been obvious to either (1) replace the Hockaday valve 110 with the Yamada porous material or (2) position the

Yamada porous material somewhere upstream or downstream of the Hockaday valve 110. Applicant respectfully submits that these positions are without merit. First and foremost, there is nothing in the Yamada '023 patent that even remotely suggests using the porous material disclosed therein in the manner proposed in the Office Action. The Yamada '023 patent teaches using porous material to **cause fluid flow, not to create capillary forces to resist fluid flow**. Moreover, with respect to replacement of the Hockaday valve 110, it certainly would not have been obvious to replace a valve, the purpose of which is to **prevent** fluid flow, with a structure that is specifically designed to **cause** fluid flow.

As the Hockaday '364 publication and the Yamada '023 patent fail to teach or suggest the combination of elements recited in claim 15, whether viewed alone or in combination, applicant respectfully submits that the rejection of claim 15 under 35 U.S.C. § 103 should also be withdrawn.

#### **E. Discussion Concerning Claims 18-21**

Independent claim 18 calls for a combination of elements including “an open region that connects [a] fuel reservoir to [a] reaction chamber” and “control means, associated with the open region, **for passively resisting fluid flow** from the fuel reservoir to the reaction chamber and **permitting fluid flow** from the fuel reservoir to the reaction chamber **in response to the presence of a predetermined pressure gradient across the control means**.” The respective combinations defined by claims 19-21 include, *inter alia*, the elements recited in claim 18.

Applicant respectfully submits that the Hockaday '364 publication fails to teach or suggest the claimed combinations. For example, the Hockaday '364 publication fails to teach or suggest a number of aspects of the functional statement in the means-plus-function element. The Hockaday valve 110, which actively controls the output of fuel, simply does not perform the function of passively resisting fluid flow. Nor does it perform the function of permitting fluid flow in response to a predetermined pressure gradient across the valve 110.

As the Hockaday '364 publication fails to teach or suggest each and every element of the combination recited in independent claim 18, applicant respectfully

submits that claims 18-21 are patentable thereover and that the rejection under 35 U.S.C. § 102 should be withdrawn.

#### F. Discussion Concerning Claims 22-30

Independent claim 22 is directed to a fuel cartridge comprising “a fuel reservoir” and “a reaction chamber.” The “reaction chamber” includes “a catalyst, an inlet operably connected to the fuel reservoir, a gas outlet, **a liquid outlet that is not in fluid communication with the fuel reservoir** and a substantially gas permeable/substantially liquid impermeable structure that substantially surrounds the catalyst and separates the inlet from the gas outlet.” The respective combinations defined by claims 23-30 include, *inter alia*, the elements recited in claim 22.

Applicant respectfully submits that the Hockaday '364 publication fails to teach or suggest the claimed combinations. For example, the only structures in the percolation generator 12 (Figure 3) that could be interpreted as a “liquid outlet” are the exit 34 and the vent 42. In contrast to invention defined by claim 22, the exit 34 and the vent 42 are clearly in fluid communication with the wicking material 39 and the interior of hydrophobic liner 32, which is where the fuel 7 is stored. [Paragraph 0107, lines 5-7.]

As the Hockaday '364 publication fails to teach or suggest each and every element of the combination recited in independent claim 22, applicant respectfully submits that claims 22-30 are patentable thereover and that the rejection under 35 U.S.C. § 102 should be withdrawn.

#### IV. NEWLY PRESENTED CLAIMS 53 AND 54

Newly presented claims 53 and 54 respectively depend from independent claims 1 and 12 and, therefore, are patentable for at least the same reasons as claims 1 and 12.

Newly presented independent claim 55 calls for a combination of elements comprising “fuel reservoir,” “a reaction chamber defining an interior surface, a fuel inlet and a single gas outlet,” “an enclosed substantially gas permeable/substantially

liquid impermeable structure defining an interior operably connected to the fuel inlet and an exterior surface and located within the reaction chamber such that a gap extends around the exterior surface from the exterior surface to the interior surface of the reaction chamber and the gap is in gaseous communication with the single gas outlet” and “a catalyst located within the enclosed substantially gas permeable/substantially liquid impermeable structure.” The cited references fail to teach or suggest such a combination. For example, the Hockaday ‘364 publication fails to teach or suggest the combination of “a reaction chamber defining ... a single gas outlet,” “an enclosed substantially gas permeable/substantially liquid impermeable structure” and “a catalyst located within the enclosed substantially gas permeable/substantially liquid impermeable structure.” Applicant respectfully submits, therefore, that claims 55-62 are patentable over the cited reference.

## **V. CLOSING REMARKS**

In view of the foregoing, it is respectfully submitted that the claims in the application are in condition for allowance. Reexamination and reconsideration of the application, as amended, are respectfully requested. Allowance of the claims at an early date is courteously solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is respectfully requested to call applicant’s undersigned representative at (310) 563-1458 to discuss the steps necessary for placing the application in condition for allowance.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-2025. Should

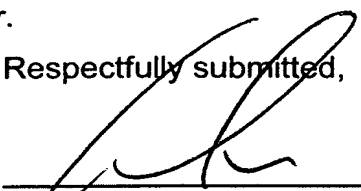


such fees be associated with an extension of time, applicant respectfully requests that this paper be considered a petition therefor.

4/6/05  
Date

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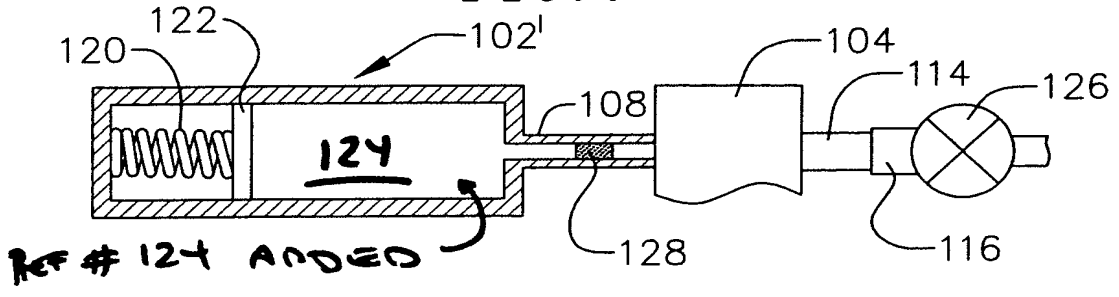
Respectfully submitted,

  
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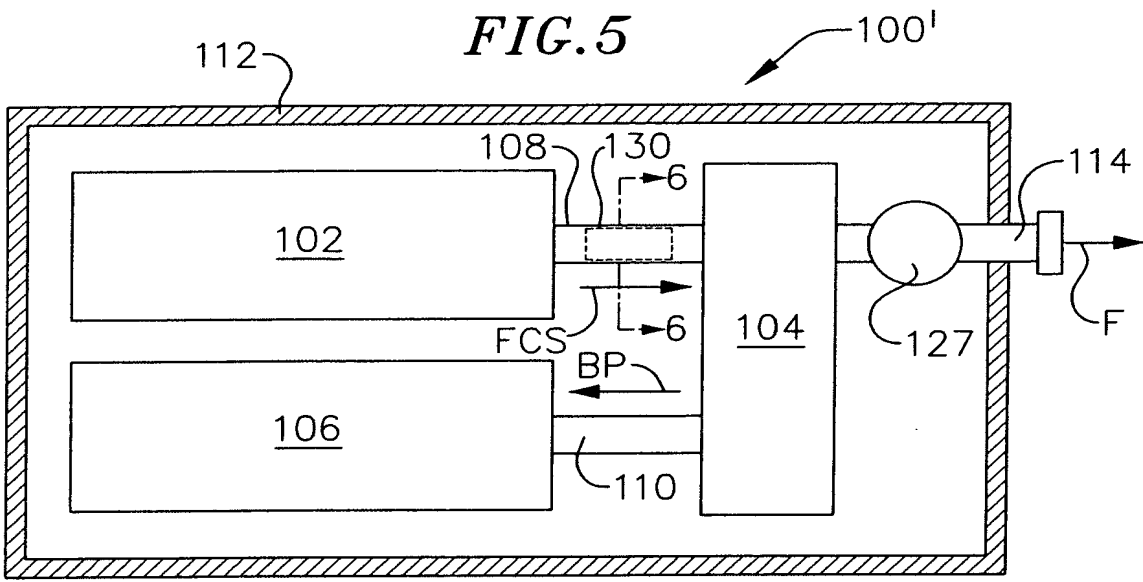


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**FIG. 4**



**FIG. 5**



**FIG. 6**

